

6a 0b 0K  
4/17/02



United States  
**CONSUMER PRODUCT SAFETY COMMISSION**  
Washington, D.C. 20207

**MEMORANDUM**

**DATE:** April 17, 2002

**TO :** EC

**Through:** Todd A. Stevenson, Secretary, OS

**FROM :** Martha A. Kosh, OS

**SUBJECT:** Proposed Exemption for Model Rocket Propellant Devices  
for Surface Vehicles HP 01-2

ATTACHED ARE COMMENTS ON THE CH-02

<u>COMMENT</u>	<u>DATE</u>	<u>SIGNED BY</u>	<u>AFFILIATION</u>
CH 02-1	10/26/01	M. Roberts	Centuri Corporation 1295 H Street Penrose, CO 81240
CH 02-2	04/12/02	Mary Roberts On Behalf of Intertek Testing Services	Centuri Corporation
CH 02-2a	04/15/02	same as above	same as above
CH 02-3	04/14/02	Mark Bundick President	National Association of Rocketry 1311 Edgewood Drive Altoona, WI 54720

Stevenson, Todd A.

---

From: mroberts@centurims.com  
Sent: Friday, October 26, 2001 11:36 AM  
To: cpsc-os@cpsc.gov  
Subject: Comments Re: Petition HP - 01-02



HP 01-02

Comments.doc

Pursuant to a letter from Todd A. Stevenson, Acting Secretary, Consumer Product Safety Commission, we are enclosing comments in response to the various staff's analyses in the CPSC Briefing Package concerning our Petition for Exemption of Model Rocket Propellant Devices for Surface Vehicles: HP 01-02.

These comments are in addition to those presented orally and in writing to the CPSC by our company president, Barry Tunick, on October 26, 2001.

Thank you for your consideration of our Petition.

Centuri Corporation  
1295 H Street  
Penrose, CO 81240  
719 372 6565 Telephone  
719 372 3419 Facsimile

<<HP 01-02 Comments.doc>>

Model Rocket Comment 6/6/01  
1 0/10/01

CENTURI'S COMMENTS IN RESPONSE TO CPSC STAFF'S BRIEFING PACKAGE  
CONCERNING HP 01-02: PETITION FOR EXEMPTION OF MODEL ROCKET  
PROPELLANT DEVICES FOR SURFACE VEHICLES

October 26, 2001

Compliance (Page 19 of Briefing Package)

**"The existing exemption for model rocket motors, 16 C.F.R. §1500.85(a)(8), covers motors for use in "light-weight, recoverable, and reflyable model rockets,"**

*Centuri has petitioned for an exemption for model rocket motors to cover motors for use in lightweight, and reusable model rocket surface vehicles.*

**"And is intended to allow relatively low power engines<sup>1</sup> to be used in model rockets designed to fly vertically into the air."**

*Centuri has petitioned to allow low power engines to be used in model rocket vehicles with engine mount permanently attached to a surface-level horizontal tether line.*

**"<sup>1</sup>The exemption limits the size and performance of these engines to 62.5 grams of propellant materials that produce less than 80 Newton-seconds of total impulse with a thrust duration not less than 0.050 seconds."**

*Centuri's current petition would limit the size and performance of engines used with surface vehicles to 30 grams of propellant materials that produce less than 20 Newton-seconds of total impulse with a thrust duration not less than 0.050 seconds.*

**"There is also an exemption for solid fuel pellets intended for use in miniature jet engines for propelling model jet airplanes, speed boats, racing cars and similar models at 16 C.F.R. §1500.85(a)(10)."**

*The characteristics/requirements for the solid fuel pellets used in these horizontally-operating products are that they weigh no more than 11.5 grams each, are coated with a protective resinous film, contain not more than 35 per-cent potassium dichromate, produce a maximum thrust of not more than 7½ ounces when used as directed and burn not longer than 12 seconds each when used as directed.*

*Centuri's petition requests exemption for model rocket motors that are designed to be ignited by electrical means from a distance of 15 feet (4.6 m); contain no more than 30 grams (1.1 ounces) of propellant material and produce less than 20 Newton-seconds (4.48 pound-seconds) of total impulse with thrust duration not less than 0.050 seconds; are constructed such that all chemical ingredients are preloaded into a cylindrical paper or similarly constructed nonmetallic tube that will not fragment into sharp, hard pieces; and are designed so that they will not burst under normal conditions of use, are incapable of spontaneous ignition, and do not contain any type of explosive or pyrotechnic warhead other than a small recovery-system activation charge.*

Compliance (Page 20 of Briefing Package)

**“The staff expressed concern regarding a number of issues, including the vehicle engine mount’s lack of a permanent attachment to the tether line that guides the car (see attached draft advertisement).”**

*Centuri made note of the concerns and issues expressed, especially the vehicle’s engine mount and redesigned the product so that the engine mount is permanently attached to the tether line at the factory.*

**“In addition, the staff had concerns about the general safety of this design concept and other designs along similar lines that might be offered to customers.”**

*Centuri has worked to respond to all expressed concerns. We provided copies of focus group studies; provided specifications of materials to be used; provided copies of packaging, instructions and warnings and safety guidelines as well as any revisions; had the products tested by an independent laboratory; and provided actual “off-tool” product to CPSC staff for their own review and tests.*

**“The staff still has concerns and questions based on its preliminary review of Centuri’s materials and field tests of the model cars.”**

*We have met with and contacted CPSC staff regularly. We have responded quickly to all questions and requests for information. Had we been made aware of additional concerns we would have done our best to address them.*

**“For example the cars travel horizontally along the ground at a high rate of speed (up to 80-90 mph for the larger design) and require approximately 100-500 feet of smooth, level concrete or blacktop for safe operation as designed. The availability of large stretches of appropriate hard surfaces may be extremely limited.”**

*Centuri believes that the speed rates and space requirements are appropriately addressed by the age recommendations provided for each product.*

**“Further, the cars can be operated off of the “tether” or guide line and therefore be pointed at anyone or anything and launched.”**

*Centuri agrees the cars can be operated off of the tether by cutting the tether and can be pointed at anyone or anything and launched. However, as noted earlier by CPSC staff a “smooth, level concrete or blacktop” is required “for safe operation as designed”. Also they have been designed to be unstable when not on the tether and their performance is therefore seriously degraded so that they will not travel as far, nor will they continue to travel accurately in the direction they have been pointed. As a result the cars will likely be damaged thus discouraging further attempts to operate the cars “off-tether”.*

**“It may also be possible to use rocket motor engines of bigger and more powerful classes than are specified for these vehicles with little or no modification to the engine mount.”**

*Centuri recognizes this possibility but believes that most consumers do not have access to the larger motors. Those consumers that do have access also have the knowledge necessary to understand the safety problems coincident with using the larger motors in the vehicles.*

**Economic Analysis (Page 23 of the Briefing Package)**

**“A model rocket motor consists of a fuel and an oxidizer. The most common motors consist of a cardboard tube in which black powder (sulphur, charcoal, and a nitrate) is compressed into a solid mass. They are available in 17 sizes ranging from “¼ A” to “O”, each size having twice the power of the preceding size.”**

*Centuri notes that Model Rocket Motors are classified as such by the US Department of Transportation and can contain no more than 62.5 grams (2.2 ounces) of propellant, thereby limiting model rocket motors to a “G” size. Rocket motors containing more than 62.5 grams (2.2 ounces) of propellant are not Model Rocket Motors, are regulated by the Bureau of Alcohol, Tobacco and Firearms and are not “available” to children.*

**“According to industry sources, about 5 million motors, in sizes “¼ A” through “D”, are sold annually for all exempted uses.”**

*Based only on Centuri’s unit sales, more than 11 million motors, in sizes “¼A” through “D”, are sold annually for all exempted uses.*

**Economic Analysis (Page 24 of the Briefing Package)**

**“These sizes refer to the amount of black powder propellant in each motor.”**

*The letter “size” of the model rocket motor refers to the total impulse of the motor. Some model rocket motors do not contain black powder propellant.*

**“According to industry guidelines, rocket motors in sizes “D” and lower are intended for use by consumers aged 10 and up. The guidelines specify adult supervision for users under age 12.”**

*These age recommendations and guidelines are in-line and appropriate to the Guidelines for Relating Children’s Ages to Toy Characteristics, prepared for the U.S. Consumer Product Safety Commission by Barbara Goodson and Martha Bronson in 1985.*

**“In California, state law requires that purchasers of motors up to size “D” must be at least 14 years old;”**

*Due to model rocketry's outstanding safety record, the required age for the purchase of "D" size engines in California was lowered from 18 years of age to 14 years of age in July of 1992.*

*Additionally, California model rocketry regulations include the following exception:*

*"Persons who are 12 years of age or older and who are taking part in a model rocket education program may receive model rocket motors and launch approved model rocket motors when under the direct supervision and control of a person 18 years of age or older. Model rocket motors must be obtained only from the adult in charge of the launching. Approved model rocket motors for this exception shall bear the motor coding 1/4A, 1/2A, A, B, C, or D."*

**"New Jersey requires purchasers of motors up to size "C" to be at least 14,"**

*Due to model rocketry's outstanding safety record, the required age for the purchase of "C" size engines in New Jersey was lowered from 21 years of age to 14 years of age in January of 1992.*

*Additionally, New Jersey model rocketry statutes include the following:*

*"A persons at least 12 years of age but less than 14 years of age who is a participant in a bona fide model rocket education program may fire a model rocket bearing the standardized coding 1/4A, 1/2A, A, B, and C only when under the direct supervision and control of a person who is at least 21 years of age and only during the course of the model rocket education program."*

**"and both states require purchasers of larger motors to be at least 18."**

*Again due to model rocketry's safety record, the required age for the purchase of model rocket engines sizes "E" through "G", was lowered from 21 years of age to 18 years of age in California in September of 1972. The age limit was lowered from 21 years of age to 18 years of age for "D" through "G" in New Jersey in January of 1992.*

**"Canada restricts sales of rocket motors in sizes "D" to purchasers over the age of 12,"**

*Centuri quotes from a February 19, 1979 letter written by B. P. McHugh, Chief Inspector of Explosives, Energy, Mines and Resources Canada regarding the deregulation of model rocketry in that country, "Throughout the years, not one disabling accident has been reported in approved activities. It has long been realized that the engines and igniters themselves present no significant hazard in themselves even if abused or involved in an external fire."*

*And in January of 1990, based on a recommendation of the Minister of Energy, Mines and Resources, the Canadian regulations were amended to include age requirements for the purchase and use of all pyrotechnics. The lowest age allowable is 12 years of age and it is for model rocket motors in Subdivision 3 of Division 2 of Class 7(sizes "D" and smaller).*

#### **Economic Analysis (Page 25 of the Briefing Package)**

**"The FHSA currently exempts solid-fuel pellets for use in model cars. The exemption applies to pellets of not more than 11.5 grams each (by comparison, size "A" rocket engines are 7 grams, and "D" engines are 44 grams).**

*Centuri's "A" size model rocket motor weighs 7 grams total but that includes a paper case, clay nozzle and cap with only 4 grams pyrotechnic material as compared to as much as 11 grams of pyrotechnic material in the currently exempted pellets.*

*Centuri's "D" size model rocket motor weighs 44 grams total but that includes a paper case, clay nozzle and cap with only 25 grams of pyrotechnic material, approximately twice that in a currently exempted pellet.*

#### Hazard Analysis (Page 28 of the Briefing Package)

**"Data from the National Electronic Injury Surveillance System (NEISS) were searched for injuries associated with the product."**

*Centuri notes from Page 25 of the Economic Analysis portion of the Briefing Package that "Pellet-powered cars were introduced in the 1950s. Currently, US sales are estimated at about 100,000 annually."*

*As the pellets are also pyrotechnic devices and because they propel model cars in the same manner as Centuri's proposed product, it is of interest that no injury cases related to the pellets or pellet-powered cars were cited. This is especially interesting as they have a 50-year history with estimated sales of 5,000,000 units in the United States during that time.*

**"Since model rocket powered cars have not been on the market, no injury cases have been reported through NEISS. Model rocket powered cars use engines identical to those in model rockets themselves."**

*Centuri also notes from Page 25 of the Economic Analysis portion of the Briefing Package that "...there is evidence of limited production of model cars that have been constructed by the intended users (e.g., hobbyists), and adapted to use rocket motors. These cars have been in use at least since the 1970s, according to references found on the Internet and industry sources." And it is noted from Page 29 of the Hazard Analysis that "With the exception of one homemade car, no incidents have been reported specifically involving model rocket powered cars because such products have not been marketed."*

*Based on the information provided, Centuri believes a different conclusion should have been reached.*

**"An estimated 1,100 injuries associated with model rockets occurred between January 1997 and December 2000.<sup>1</sup>" And the footnote, "The coefficient of variation for this estimate is 0.26."**

*Centuri disagrees with the projected level of injuries. Our data suggests that the injury rate is far less than the CPSC projection. However, using CPSC's data of 1,100 injuries and unit sales*

*of 20,000,000 model rocket motors over a four-year period, this equates to a model rocketry safety record of more than 99.99%.*

#### Hazard Analysis (Page 29 of the Briefing Package)

**“In addition to NEISS, other CPSC databases (IPII, INDP, DTHS) were searched in order to obtain only those incidents containing the words “rocket”, “plane”, or “car” in several product codes for powered models.<sup>2</sup>” And the footnote “The table below details the criteria used to identify reported incidents in the CPSC databases that relate to model rocket powered cars.”**

*Centuri disagrees that all of the identified reported incidents relate to model rocket powered cars.*

**“The resulting incidents do not constitute a statistical sample and therefore can not be used to produce estimates of injuries.”**

*As stated previously, Centuri believes a different conclusion should have been reached.*

**“Some powered model airplane incidents involving mechanical hazards were included because both powered model airplanes and model rocket powered cars are projectiles that travel in a horizontal trajectory.”**

*Centuri disagrees with this statement because model airplanes usually travel at or above the level of the modeler's head. Model rocket vehicles will usually travel at surface level. Further powered model airplanes often weigh several pounds while the proposed model rocket cars will weigh only ounces.*

**“These mechanical hazards include cases in which the injured person was struck or impaled by the product or a part of it.”**

*Centuri notes that all three cases of impalement cited involved the propellers of model airplanes (Hazard Analysis Page 32) and disagrees with the comparison because spinning propellers must have sharp edges to be functional.*

#### **“Deaths**

**In 1982, a 40-year-old male died of internal hemorrhage and trauma to the liver when a model airplane flew into his chest. In addition, in 1993, a 44-year-old male died after being struck in the head by a flying model airplane.”**

*Centuri disagrees with these comparisons of model airplane related fatalities due to the size and weight differences of model airplanes and the proposed model rocket cars.*



*While information concerning the airplanes involved in the incidents was not included we assume the airplane involved in the 1982 incident must have been quite large and heavy to do the type of damage noted.*

*Also according to industry sources, the airplane involved in the 1993 incident was estimated to have an approximate 60-inch wingspan, weighed about 5 pounds, and was powered by a .40 cubic inch gas engine. The plane was estimated to be flying at an estimated speed of 200 miles per hour.*

*Centuri also disagree with the comparison due to the altitude difference of the horizontal planes in which model airplanes and the proposed model rocket surface vehicles operate.*

### **"Injuries**

**In addition to the two deaths noted above, CPSC is aware of 35 injury incidents involving products similar to model rocket powered cars."**

*Centuri contends that many of the 35 injury incidents cited involve products that are not similar to model rocket powered cars. It is also of interest that nearly 22 years of data and three databases were reviewed to find the 35 reported incidents (January 1, 1980 to May 26, 2001 from the table on Page 29 of the Briefing Package).*

*Of the cases cited, two injuries were the result of the ignition of gasoline and two injuries were from the ignition of chemicals used to make homemade propellants (Pages 32, 34 and 36 of the Briefing Package).*

*Five of the cases cited involved model rocket engines but listed no injuries (Page 33 of the Briefing Package).*

*One listing cited one individual falling atop another (Page 35 of the Briefing Package). This can happen with or without a product of any kind.*

**"Approximately 57% of the incidents involved fires, burns or explosions."**

*Centuri notes that the currently exempt pellet-powered vehicles pose the same risks. Yet despite the number of units estimated sold in the U.S. during the last 50 years, there were no incidents reported.*

**Hazard Analysis (Page 30 of the Briefing Package)**

### **"Conclusions**

**Although we have no data on the specific product in question, we believe the incidents described offer sufficient evidence for concern."**

*Centuri disagrees with this conclusion and believes the data provided by Hazard Analysis confirms an exceptional safety record for model rocketry and a comparable one for both model rocket powered and pellet powered cars.*

**“The hazards associated with model rockets and powered model airplanes are similar to those that may be experienced with model rocket powered cars.”**

*Centuri disagrees with this conclusion for the following reasons:*

*There are size and weight differences between powered model airplanes and model rocket powered cars.*

*Model airplanes are either free flight, radio-controlled or u-control. Both, the launch pad and the model's fins or other stabilizing features directs a model rocket's flight. Model rocket cars are operated and anchored on a "tether" line.*

*Both model airplanes and model rockets are designed to operate in the sky. Model rocket cars are designed to operate on the ground at surface level.*

**“Because the engines are identical to model rocket engines, fires, burns and explosions can be expected with the marketing of model rocket powered cars.”**

*Centuri recognizes this possibility but believes its products, instructions, safety guidelines and warnings will continue to provide exceptional safety for our consumers as evidenced by our 40-plus year history and a safety record substantiated by CPSC data exceeding 99.99%.*

**“Because the model rocket powered cars were shown to have an airborne capability in CPSC testing, they may exhibit the same hazards as those in the deaths and injuries associated with powered model airplanes.”**

*Centuri disagrees with this conclusion for the same reasons stated previously:*

*There are size and weight differences between powered model airplanes and model rocket powered cars.*

*Model airplanes are either free flight, radio-controlled or u-control. Model rocket cars are operated and anchored on a "tether" line.*

*Model airplanes are designed to operate in the sky. Model rocket cars are designed to operate on the ground at surface level.*

Engineering Sciences (Page 40 of the Briefing Package)

**“A model rocket engine consists of a fuel and an oxidizer compressed into a cardboard tube. The most common motor contains black powder (sulphur, charcoal, and a nitrate) and is available in sizes “¼A” through “O”.**

*Centuri notes that Model Rocket Motors are classified as such by the US Department of Transportation and can contain no more than 62.5 grams (2.2 ounces) of propellant, thereby limiting model rocket motors to a "G" size. Rocket motors containing more than 62.5 grams (2.2 ounces) of propellant are not Model Rocket Motors, do not contain black powder propellant, are regulated by the Bureau of Alcohol, Tobacco and Firearms and are not "available" to children.*

**Engineering Sciences (Page 42 of the Briefing Package)**

**"Anyone standing near or straddling the tether line becomes a potential target."**

*Centuri's instructions, warnings and safety guidelines tell consumer not to be or allow others to be near the tether line any time the rocket car is running.*

**"An resulting injuries with the use of rocket cars would be dependent on the size of the model"**

*The size of the model would be limited by the motor sizes available for power.*

**"and the rocket motor,**

*If Centuri's petition were granted regulation would limit the size of the rocket motor to "D".*

**"the model material,"**

*If Centuri's petition were granted regulation would limit the model material to balsa wood, plastic and other lightweight materials.*

**"the kinetic energy and trajectory of the vehicle,"**

*The size, shape and weight of the vehicle, its "D" size or smaller motor and their combined performance characteristics would limit the kinetic energy. The "tether" line would determine the trajectory.*

**"and the part of the body that may be struck by the vehicle."**

*Centuri's instructions, warnings and safety guidelines tell consumers not to be or allow others to be near the tether line any time the rocket car is running. And we reiterate model rocket cars are designed to operate on the ground at surface level.*

**"It was clear, however, that anyone standing forward of the launch site could be in the potential path of a non-tethered, uncontrolled vehicle."**

*Centuri's products have been designed so the motor mount is permanently attached to the tether line. Yet the cars could be operated off of the tether by cutting the tether. However, the products*

*have been designed to be unstable and "In all cases, the cars traveled haphazardly forward, quickly expending their fuel" (Page 42 of the Briefing Package). And, "There was no indication during the reasonable and foreseeable use and misuse tests that the car could change direction and travel back towards the operator" (Page 42 of the Briefing Package).*

*Centuri's instructions, warnings and safety guidelines direct and warn consumers not to run the cars off the tether.*

**"the greatest potential for injury exists during the launch phase of the activity in the area immediately surrounding the launch site."**

*Centuri has designed the products to minimize any potential for injury. The products have been designed to be ignited electrically and remotely. The engines have been limited to "D" size. The rocket cars are to be made of lightweight materials and the engine mounts have been designed to be permanently attached to the tether lines at the factory.*

**"Clearly, any misuse of the launch pad – aiming or use on an uneven surface – would increase the potential for injury."**

*Centuri has designed the product to be unstable causing failure and self-destruction of the product when it is not used in accordance with instructions thereby thwarting attempts to misuse the product.*

**"However, due to the horizontal and vertical freedom within the tether system, the potential for injury exists to those within the boundaries of the rocket car's path."**

*Centuri's Product has been designed so motor mount is to be permanently attached to tether line. And, "Engineering Sciences staff concludes that the tether system not only restricts and/or defines the direction of travel for the surface vehicle, but also provides a significant increase in the performance characteristic of the vehicle (Page 42 of the Briefing Package).*

*And importantly, Centuri's instructions, warnings and enclosed safety guidelines directs and warns consumers not to be or allow others to be within 15 feet of the launch area or the tether line any time the rocket cars are running.*

#### **Health Sciences (Pages 44 and 45 of the Briefing Package)**

**"Demonstration of these products, under prescribed conditions and those that are reasonably foreseeable (e.g., untethered, or on pavement that is not level or entirely free of debris) revealed that the products have the potential to 1.) misfire,"**

*A misfire is a situation where the model rocket engine does not ignite. This does not harm anyone.*

#### **Health Sciences (Page 45 of the Briefing Package)**

**“2.) travel along unpredictable paths when untethered,”**

*The engine mount of Centuri's product has been permanently attached to the tether at the factory. The consumer must alter the set considerably to run the car off the tether. As noted previously the cars have been designed to be unstable when used off the tether. Their performance is seriously degraded and the cars may self-destruct thereby discouraging any further attempts. Another factor is the cost of the model rocket motors, which will discourage misuse and waste. And, once again, Centuri points out that our instructions; warnings and safety guidelines direct the consumer not to use the product off the tether.*

**“3.) become airborne in both tethered and untethered conditions,”**

*This potential generally only exists if the vehicle is launched improperly or hits debris on the track surface. However, when run on tether, the tether system also anchored to the ground, not only restricts and/or defines the direction of travel for the surface vehicle, but also provides a significant increase in the performance characteristic of the vehicle (Page 42 of the Briefing Package).*

*And importantly, Centuri's instructions, warnings and enclosed safety guidelines directs and warns consumers not to be or allow others to be within 15 feet of the launch area or the tether line any time the rocket cars are running.*

*And while the cars may become airborne when run off tether, the products have been designed to be unstable and “In all cases, the cars traveled haphazardly forward, quickly expending their fuel” (Page 42 of the Briefing Package). And, “There was no indication during the reasonable and foreseeable use and misuse tests that the car could change direction and travel back towards the operator” (Page 42 of the Briefing Package).*

**“and 4.) impart significant energy to objects in their path (even after the engine has ceased firing). Speed in excess of 80 miles per hour were recorded.”**

*A Centuri “A” size model rocket engine provides total impulse of 2.5 Newton-seconds (0.56 pound-seconds). This impulse is delivered over a period of 0.8 of a second. Under optimal circumstances and including coast time, this will power a 76-gram (2.7-ounce) rocket car along a tether for approximately 27-30 m (90-100 feet). In most cases, the rocket car goes about 20 meters (65 feet). The maximum thrust delivered at any time (and only for a split second) is 13 Newtons (3 pounds).*

*A Centuri “D” size model rocket engine provides total impulse of 20 Newton-seconds (4.48 pound-seconds). This impulse is delivered over a period of about 2 seconds. Under optimal circumstances and including coast time, this will power a 184-gram (6.5-ounce) rocket car along a tether for approximately 152-183 m (500-600 feet). The maximum thrust delivered at any time (and only for a moment) is 27.6 Newtons (6.2 pounds).*

*Again, Centuri reiterates that our instructions, warnings and safety guidelines enclosed with every product advise the consumer to remain a minimum of 4.5 m (15 feet) away from the launch*

*and tether lines whenever the cars are running. It is also noted that the larger car is marketed only to those 18 years of age and older.*

**“The Division of Hazard Analysis staff (R. Ingle, 2001) examined CPSC databases over a 20-year period for injury incidents in which model rockets, their engines, or model airplanes were involved. Thirty-five cases were identified.”**

*As noted previously it is of interest that a period of nearly 22 years and three databases were examined to find a total of 35 incidents. Of those, the three impalement injuries involved spinning model airplane propellers that must be both sharp and hard to function properly. Many other cases involved gross abuse of the product.*

**“Health Sciences considered 15 nonfatal injury incidents related to model rockets and/or model rocket engines. These cases did not appear (emphasis added) to involve product misuse.”**

*Centuri has reviewed the 32 nonfatal cases alleged by CPSC as being related to model rockets and/or model rocket engines and notes the following:*

*Two of the cases listed did not mention commercial model rocket engines and noted only “homemade rockets and/or mixtures of chemicals” that were ignited.*

*One of the cases listed was one individual falling atop another causing injury. This could have been caused with or without any type of consumer product.*

*Five of the cases listed did not mention an injury.*

*Four of the cases listed allege (by absence of any ignition source) spontaneous combustion which is not possible. Model rocket motors have been tested by agencies of the US and many foreign governments as well as by experts and independent laboratories many times in the past 40-plus year history of the activity and this has been confirmed over and over. These four cases like the other ten listed as such, were cases of misuse by the consumer.*

*Of the ten listed as Misuse cases, two of them involve the ignition of gasoline.*

**“Most of these injuries were burn/explosion injuries associated with rockets or rocket engines igniting or exploding.”**

*Centuri reiterates:*

*Two of the cases listed did not mention commercial model rocket engines and noted only “homemade rockets and/or mixtures of chemicals” that were ignited.*

*Five of the cases listed did not mention an injury.*

*Four of the cases listed allege (by absence of any ignition source) spontaneous combustion which is not possible. Model rocket motors have been tested by agencies of the US and many foreign governments as well as by experts and independent laboratories many times in the past 40-plus year history of the activity and this has been confirmed over and over. These four cases like the other ten listed as such, were cases of misuse by the consumer.*

**“Based on a review of the materials provided by the petitioner, a review of the videotaped initial demonstration, participation in the independent demonstration, and a review of the injuries associated with model rocketry, the Health Sciences’ staff has assessed the typed of injuries that may (emphasis added) occur as a result of consumer use of these two model rocket vehicles.”**

*Centuri reiterates that it has designed the proposed products, instructions warning and safety guidelines to minimize any potential that injuries may occur. And we believe that our history of 40-plus years with a record of safety greater than 99.99%) is a better predictor of the future than supposition. (The injury rate of 0 .000055 is substantiated by CPSC data using a figure of 1,100 injuries extrapolated from 4 years of NEISS data against very conservative sales data of more than 20,000,000 model rocket engines sold during the same time period. Centuri believes this injury rate to be greatly overstated as the actual number of model rocket engines sold each year is over 11,000,000 not the 5,000,000 cited by CPSC staff in the Briefing Package.)*

*Further, Centuri comments that we are constantly working to reduce and/or eliminate the possibility of any injury related to our products.*

#### Health Sciences (Page 46 of the Briefing Package)

**“Were the engine’s nozzle to be blocked due to a manufacturing defect or intentional or unintentional obstruction, there is also the risk of injury due to explosion (personal communication, Patrick Race, Neal Gasser).”**

*Centuri comments that a manufacturing defect is nearly impossible due to the automated manufacturing process used to manufacture model rocket engines and the quality assurance tests to which the engines are subjected. Centuri manufactures more than 11,000,000 model rocket engines annually. To the best of Centuri’s knowledge, this type of incident has not occurred.*

*Further, if the nozzle were blocked due to a manufacturing defect, the consumer would not be able to ignite the engine as an igniter or any other ignition device could not be inserted into the nozzle.*

*Centuri also points to the use of the igniter plug that is inserted into the nozzle of the model rocket engine to hold the electrical igniter in place. The plug effectively and completely blocks the nozzle until ignition. The gases produced by the ignition of the engine push the plug from the engine’s nozzle immediately. So quickly, that the small plastic plugs are reusable.*

**“An explosion of a rocket engine *could* (*emphasis added*) produce bruises, abrasions, lacerations, or more severe injuries, including burn injuries or impalement injuries caused by flying pieces of debris.”**

*Centuri notes some of the many reasons why this is extremely improbable:*

*Model rocket engines are constructed such that all chemical ingredients are preloaded into a cylindrical paper or similarly constructed nonmetallic tube that will not fragment into sharp, hard pieces.*

*Model rocket engines are designed so that they will not burst under normal conditions of use, are incapable of spontaneous ignition, and do not contain any type of explosive or pyrotechnic material other than a delay and small recovery system activation charge.*

*Model rocket engines bear labeling and include instructions providing adequate warnings and instructions for safe use.*

*Model rocket engines must be tested and meet the requirements of the U.S. Department of Transportation to be classified as such prior to being transported and distributed commercially.*

*Centuri's model rocket engines have been tested and certified to meet the requirements specified by the National Fire Protection Association as well as many state and foreign governments including Canada, the United Kingdom, Germany and France.*

*More than 3% of Centuri's model rocket engines are subjected to rigorous and strict internal Quality Assurance tests on a continual basis. Such testing includes ignition of each of the engines tested.*

*Model rocket engines are ignited electrically.*

*Model rocket engines are ignited remotely from a distance of 4.5 m (15 ft.) or more.*

*Model rocket cars will be lightweight and constructed mainly of materials such as balsa wood or plastics that will not fragment into sharp, hard pieces.*

## **“CONCLUSION:**

**Operation of the proposed model rocket vehicles poses the risk of serious injuries, including burn injuries, ocular or facial injury, and fractures of small bones.”**

*Centuri disagrees with this conclusion. Centuri has manufactured and sold over 300,000,000 model rocket motors over the past 40 years, with very few injuries. CPSC's own estimate is that the injury rate is 0.000055%. Additionally, the pellet-powered cars have been sold for over 50 years, with no apparent reports of injury. Our cars operate in a very similar manner. Given the overall safety record of model rocket engines as well as the pellet-cars, there is no legitimate*



*basis for the staff's conclusion.*

Human Factors (Page 49 of the Briefing Package)

**“However, adults are likely to purchase these vehicles for children younger than the intended age.”**

*Centuri notes the following CPSC statement (Page 49 of the Briefing Package):*

*“According to - . . . . . 1985, combustion flyable rockets are appropriate for children around age 12, but can be operated with adult supervision by slightly younger children (age 10 or 11).”*

**“The larger vehicle is age graded for age 18 years of age and older, but the more powerful “D” motor that powers it is age graded on the product package by the firm for “...Ages 10 and up. Adult supervision for those under 12...” Since the vehicle is powered by the motor, the recommended age on the motor package is a factor likely to influence for whom the vehicle is purchased. This means adults are likely to purchase it for children ages 12 years and older.”**

*Centuri notes that the “D” model rocket motor is appropriately age graded for its use in flying model rockets. However, Centuri will take steps prior to shipping the Screamin’ Eagle product to revise the motor packaging for the Screamin’ Eagle model rocket engines so that the packaging reflects the recommended age of 18 years and older. In addition, Centuri will change the packaging so it is clearly differentiated from our standard model rocket engines.*

**“Therefore, the large model rocket vehicle is likely to be purchased for and used by children ages 12 years and older.”**

*Centuri recognizes this possibility but points out that the need to assemble the product, the price of the product, the price of the model rocket engines and the space required to operate the product will limit the sales of the product. Also the product will be sold in hobby shops and other specialty retail outlets, the consumers will likely be a hobby enthusiast familiar with construction of models and the performance characteristics of model engines.*

Human Factors (Page 50 of the Briefing Package)

**“Because of the repetitive play nature of the product, it may lose its power and effect and bore its users.”**

*Centuri believes the price of the product and the price of the model rocket engines to be such that it will not be operated so often that it will lose its attraction to the consumer. Our experience with model rocket kits suggests that the consumer is unlikely to launch the rocket car much more than six times.*

**“Therefore, launching the vehicle off the track may become an attractive alternative.” And the statement, “Therefore, based on the repetitive nature of the products and the subjects’ responses during the interview with the boys and the focus group discussion with the mothers, it is likely that some of the users may experiment and launch the vehicle without the race line.”**

*Centuri repeats the CPSC’s statements resulting from their review of the marketing study, “...unanimously, the race line is preferred because it assures speed and control. None of the boys suggested eliminating it” (Page 50 of the Briefing Package).*

*And Centuri reiterates, the cars have been designed to be unstable when not on the tether and their performance is therefore seriously degraded so that they will not travel as far, nor will they continue to travel accurately in the direction they have been pointed. As a result the cars will likely be damaged thus discouraging further attempts to operate the cars “off-tether”.*

**“This is likely if children play by themselves or with friends and less so during family outings where adult supervision is heightened.”**

*Centuri does not agree that this is “likely”, based of the behavior and safety record of our consumers over the past 40-plus years of model rocketry. More than half of our consumers are youngsters, who take a great deal of pride in carrying out their model rocket activities in a safe and responsible manner.”*

#### **Human Factors (Page 51 of the Briefing Package)**

**“As with all studies conducted by those who have a proprietary interest in the outcome, there are some inherent limitations and therefore, these results must be viewed with appropriate scientific reservation. For example, one defect of this research is omission of the larger, more powerful vehicle.”**

*Centuri respectfully disagrees with these observations for the following reasons:*

*As we do not intend to market the larger car, Screamin’ Eagle to children, it was considered irrelevant to test it with children.*

*This marketing study had several objectives. First, we wanted to determine if the product as designed, could be used as intended, including understanding and following the instructions. Second, we wanted to see what the level of interest in the product is for its intended age grade. Third, we wanted to gain insight into potential play patterns. This study was performed by a professional independent firm. The adult product was not shown to the children, as that product is not ever intended to be used by children. The assertion that Centuri was somehow acting with duplicity by not showing the adult product to the children is absurd and inflammatory.*

*The firms conducting this type of study know that objectivity is of utmost importance to their clients. If a product will not sell or sell well, they must advise their client or risk losing their credibility and reputation.*

**“Therefore, some children who would receive the larger one are just as likely to launch it off the tether as they would the smaller one. This may have been demonstrated in the study if it had been tested.” And the statement, “However, as stated earlier some children may launch a vehicle off the track to show it off to a friend.”**

*Centuri reiterates that it is not “likely” based on the responsible behavior our consumers have exhibited historically. It is also not “likely” for all of the other reasons stated previously including the cost of the product, the cost of its engines, the performance characteristics of the car, and the instructions, warnings and safety guidelines directing the consumer not to run it off-tether.*

**“Children may use a vehicle in other ways to discover what else may be done with this product. According to Estes’ interview portion of the marketing study, some children may use it with a ramp, set up barriers, and experiment with different string tensions. If they do so, such uses may have a similar effect as when using it off the tether. This is confirmed by the firm’s assembly instructions for both vehicles where they suggest that use with a ramp could cause the cars to become airborne. Additionally, on page 9 of the firm’s revised test report, when the larger, Screaming Eagle vehicle was tested with slack in the line, it “flipped over, jumped in air”.”**

*Centuri repeats, “Engineering Sciences staff concludes that the tether system not only restricts and/or defines the direction of travel for the surface vehicle, but also provides a significant increase in the performance characteristic of the vehicle (Page 42 of the Briefing Package). And reiterates, the cars have been designed to be unstable when operated off the tether. Their performance is seriously degraded if not operated properly. The cars may self-destruct thereby discouraging any further attempts of incorrect usage. Another factor is the cost of the model rocket motors, which will discourage improper use. And, once again, Centuri points out that our instructions, warnings and safety guidelines direct the consumer not to use the product in these ways.*

**“Lab testing showed even when used according to directions, the toy could go out of control. During testing, at about 100 to 110 feet down the tether, the toy vehicle became airborne about 4 feet (still tethered) and flipped over backwards on the ground, travelling down the tether on its back a few more feet. Debris or a bump in the test surface may have been contributing factors. Just prior to this test, the launch was successful, however. Irregularities in, and debris on the road are common and may cause these fast-moving vehicles to lose control even while tethered.”**

*Centuri notes that these statements concern the larger car, the Screamin’ Eagle, which is for individuals 18 years and older. Despite the car becoming airborne it was still on tether and anchored. As noted it continued only for a few more feet. The instructions, warnings and safety*

*guidelines direct the consumer and all others to remain a minimum distance of 4.5 m (15 ft.) from the launch area and tether line at all times the car is running.*

**Human Factors (Page 52 of the Briefing Package)**

**“Steps 3 (assembling front wheels) and 4 (assembling rear wheels) requires 6 and 4 steps, respectively. However, there is only one visual for each wheel which is intended to serve as the illustration for all of the steps. This is not an effective visual nor a recommended practice and may be confusing for some children, and adults who may be requested to assist. In step 5, the front line guide attaches to the front wheel housing by first inserting a portion of the guide through a small hole in the housing, then by using a screw. The written instructions do not mention the small hole nor does the visual adequately show it. Thus, neither a child nor an adult is likely to look for it, but may notice it through trial and error. The overall instructions contain too many visuals on a page, which may make it difficult for users to focus on any one visual to help them through a procedure. Unless improvements are made to the instructions, some children may have difficulty following them.”**

*Centuri notes that these statements concern the larger car, the Screamin’ Eagle, which is for individuals 18 years and older. This is an instructional issue. We would be glad to meet with CPSC staff to review the instructions to ensure the staff’s concerns are addressed.*

*Also as the product will be sold in hobby shops and other specialty retail outlets, the consumers who purchase it will likely be hobby enthusiasts familiar with construction of models.*

*These statements seem somewhat contradictory as they suggest there is “not enough visuals” for Steps 3 and 4 and then later state that the instructions contain “too many visuals” on a page, “making it difficult to focus on any one visual”.*

*However, Centuri is most willing to revise the instructions until they meet CPSC’s approval.*

**“For the smaller vehicle, the instructions are not listed vertically by number but, rather rely on arrows at points in the instructions to get a user through a procedure. Depending on the location of the text in the instructions, the direction of the arrow changes. According to Estes marketing study, these instructions were not easy to use, because the “...sequence was not precise enough in the step-by-step set up.” Therefore, while the instructions may be easy for these children to read, they may be difficult to follow.”**

*Based on early input from the Marketing Study and product revisions based in part on recommendations from CPSC personnel, the instructions referred to in the Marketing Study, were revised, beta-tested and revised again before submission to the CPSC. They were then forwarded to the independent laboratory for review. The instructions have since been revised to include all of their suggestions and recommendations. We believe the latter revision has been provided to CPSC staff as well.*

*Nevertheless as noted previously, Centuri is most willing to revise the instructions based on CPSC input.*

**Human Factors (Page 53 of the Briefing Package)**

**“The warning labels in the assembly instructions are buried and may not attract attention. Therefore, based on data such as the NO DIVING study, children often do not attend to warnings and the comparatively inconspicuous (emphasis added) warnings in the assembly instructions may have little to no influence on children.”**

*Centuri comments, with regard to labeling (warnings), that Human Factors staff noted that warnings were located on various pages throughout the instructions.*

*The notation was followed by the authoritative statement “Researchers contend that an effective warning is one that is noticed, then read and understood, and induces compliance. Then an experiment was cited where a “NO DIVING” sign is placed in a conspicuous (emphasis added) location close to a shallow water area. Also cited from the experiment was the statement, “...the majority of middle and high school students who participated in the experiment did not recall seeing the warning sign during a 4-week period that the sign was posted in a conspicuous (emphasis added) location” (Page 53 of the Briefing Package).*

*The experiment cited would seem to indicate that putting all of the warnings in a “ conspicuous or up-front” location may make them less noticeable. Therefore Centuri’s practice of placing warnings throughout product instructions so that they are located adjacent to text and illustrations pertinent to the warnings, may be more effective. This may be so because in the context of the instructions it is more likely to be read and understood and therefore more likely to induce compliance. And this appears to be substantiated by the safety record our consumers have established over more than 40 years.*

*Nonetheless, Centuri is most willing to print the warnings in any size and additional location in the instructions as deemed appropriate by CPSC.*

# Centuri Corporation

ESTES INDUSTRIES • COX

*Model Rocket Comment*

*2*

PO Box 227, 1295 H Street,  
Penrose, Co 81240 USA  
Phone: (719) 372-6565  
Telefax: (719) 372-3217

*Letter to P 2*

April 12, 2002

Via Facsimile and by FedEx

Phone: 301 504 0800  
Facsimile: 301 504 0127

Office of the Secretary  
US Consumer Product Safety Commission  
4330 East-West Hwy, Room 501  
Bethesda, MD 20207

Proposed Exemption for Model Rocket Propellant Devices for Surface Vehicles  
HP 01-2

Dear Madam/Sir:

We submit the enclosed independent Technical Report #20159 (and video via FedEx) from Intertek Testing Services as a public comment in support of the Proposed Exemption for Model Rocket Propellant Devices for Surface Vehicles (Petition HP 01-2).

Please call Barry Tunick or me at 1.800.525.7563 should you have questions or require additional information concerning the enclosures or the information contained therein. Thank you in advance for your consideration of our petition.

Kind Regards,

*Mary Roberts*

Mary Roberts, Manager  
Technical Services

Enclosures: (Five copies of the Letter and Technical Report and  
one copy of the accompanying video tape)

# ITS Intertek Testing Services

## Labtest

### TECHNICAL REPORT

Report # 20159

Centuri Corporation  
1295 H Street  
Penrose, CO 81240

April 9, 2002

Revised: April 12, 2002



Requested by:	Mary Roberts
Authorization Received :	March 13, 2002
Sample Name:	Rocket Cars
Model/Style #:	N/A
Sample Received:	March 13, 2002
Number of Samples:	7
Condition Received:	Good
Labeled Age Group:	12 years +
Age Grading to be Applied:	12 years +
Testing Completed:	April 8, 2002

### SUMMARY:

#### Flammability:

Based upon the results of the test reported above, the submitted sample **DOES COMPLY** with the requirements of the U.S. Federal Hazardous Substances Act, 16 CFR 1500.44 and ASTM F963-96a, Section 4.2.

#### Tensile Strength:

See page 3 for detailed findings.

#### Labeling Review:

See page 4 for detailed findings.

#### Performance Review:

As can be seen by the videotape, when subjected to misuse the item performs in a random fashion. Under certain circumstances\*, such as launching the engine alone or launching car in a vertical direction, a potentially hazardous situation may occur and may prove to be potentially dangerous. Therefore, to avoid potential hazards, the consumer should use the product as intended and heed all warnings.

#### Mechanical Hazards:

When tested as specified, the submitted sample **DOES COMPLY** with the ASTM F963-96a requirements for Mechanical Hazards.

*Albert J. Rapella*  
Albert J. Rapella

Supervisor, Technical Services

Reviewed by:

*Jeffrey D. Lipko*  
Jeffrey D. Lipko

Technical Director, Hardlines

It

Intertek Testing Services NA Inc.  
70 Diamond Road, Springfield, New Jersey 07081, U.S.A.  
Telephone: (973) 346-5500 • Fax: (973) 379-5232

**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

**April 12, 2002**  
**Report #: 20159**

**Flammability Test: Federal Hazardous Substances Act and ASTM F963-96a**

**Procedure:**

The method of testing was that described in 16 *CFR* 1500.44 of the *Federal Hazardous Substances Act and ASTM F963-96a* for rigid and pliable solids.

**Requirement:**

A material is considered "flammable" if it ignites and burns with a self-sustained flame at a rate greater than 0.1 inches per second along its major axis.

**NOTE:**

It is our understanding that a sample is considered as having passed the test requirement if it self-extinguishes before burning 6 inches and prior to the lapse of 60 seconds.

**Sample ID:**            **Rocket Car**

**Test Results:**

	<b><u>Area of Initial Flame Contact</u></b>	<b><u>Burn Length (inches)</u></b>	<b><u>Time (seconds)</u></b>	<b><u>Burn Rate (inches/second)</u></b>
Burn 1	Left Front	2.00	60	0.03
Burn 2	Right Front	1.75	60	0.03
Burn 3	Left Rear Wheel	--	--	DNI
Burn 4	Right Rear Wheel	--	--	DNI

Sooty residue was emitted for smoke as sample was burning.

\*DNI = Did not Ignite

\*\*IBE = Ignited but Extinguished

**Conclusion:** Based upon the results of the test reported above, the submitted sample does comply with the requirements of the U.S. Federal Hazardous Substances Act, 16 *CFR* 1500.44 and ASTM F963-96a, Section 4.2.



**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

**April 12, 2002**  
**Report #: 20159**

**Tensile Strength:**

**Procedure:**

The method of testing was that described in ASTM D2256 Tensile Properties of Yarns by the single strand method.

**Sample ID:**            **Guideline**

**Test Results:**

**STRENGTH**  
**(LBS.)**

44.6

44.4

46.1

44.4

44.5

43.7

44.3

43.7

44.5

44.2

**Average:**            44.4

**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

**April 12, 2002**  
**Report #: 20159**

**Product Review:**

The item submitted for Product Review was identified as "Rocker Powered Blurzz".

**Warnings and Labels**

After evaluation of the submitted Warnings and Operating Instructions, it is recommended that the Warning sign consisting of the "Equilateral Triangle with Exclamation Point" be enlarged to be more visible. The wording is appropriate bringing to the attention of the consumer the possible danger associated with this product if directions are not properly followed.

It is also recommended that the Rocket Powered Blurzz be tested in dis-accordance to the Instruction Manual such as racing the car on it's back, side and without the guide line as a way to alter its intended usage.

It is recommended that this product be Tested and Graded at 12 years and above.

**Testing:**

- Use/Abuse Testing (ASTM F963-96a) including section 4.8 – Accessible Points
- Flammability as per Annex 5.6 (Ref. 16 CFR 1500.44)
- It is also recommended that any disposable packaging be tested for compliance with the "Model Toxics in Packaging Legislation" (formerly known as "CONEG")

**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

**April 12, 2002**  
**Report #: 20159**

**Performance Testing:**

As per the client's specifications, the Rocket Car was subjected to performance testing 12 (twelve) times utilizing the instructions supplied with the samples. In addition the Rocket Car was used in foreseeable misuse scenarios 16 (sixteen) times.

As per the client's request the testing was videotaped, please refer to the following list for the order of the performance testing videotaped:

- 1 - Normal Use
- 2 - Normal Use
- 3 - On side, with line guide
- 4 - On side, with line guide
- 5 - Normal Use
- 6 - Normal Use
- 7 - Normal Use
- 8 - Normal Use
- 9 - Misused - into a wall with no line guide
- 10 - Misused - No line guide
- 11 - Misused - No line guide - up ramp
- 12 - Misused - No line guide
- 13 - Misused - No line guide
- 14 - Misused - No line guide - on roof
- 15 - Misused - No line guide - on side
- 16 - Misused - No line guide
- 17 - Misused - Rocket engine only\*
- 18 - Misused - Set up as rocket leaning on parachute holder\*
- 19 - Misused - No line guide
- 20 - Misused - Straight up
- 21 - Misused - Line guide - up ramp
- 22 - Misused - No line guide - up ramp

**Conclusion:** As can be seen by the videotape, when subjected to misuse the item performs in a random fashion. Under certain circumstances\*, such as launching the engine alone or launching car in a vertical direction, a potentially hazardous situation may occur and may prove to be potentially dangerous. Therefore, to avoid potential hazards, the consumer should use the product as intended and heed all warnings.

**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

**April 12, 2002**  
**Report #: 20159**

**MECHANICAL HAZARDS, ASTM F963-96a**

**Sample ID:** Rocket Cars      **Packaging Included:** Yes  
**Labeled Age Group:** 12 years +      **Appropriate Warning Labeling:** Yes  
**Age Grading to be Applied:** 12 years +      **Number of Samples:** 7

**Procedure:** The submitted samples were tested to the applicable sections of *ASTM F963-96a* requirements for Mechanical Hazard.

P = Pass		F = Fail		N/A = Not Applicable	
Clause	Description	P	F	N/A	
4.0	Safety Requirements				
4.1	Material	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.4	Electrical/Thermal Energy	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.5	Impulsive Noise	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.6	Small Objects				
4.6.1	Children under 36 months – no small parts allowed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.7	Accessible Edges	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.8	Accessible Points	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.9	Projections	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.10	Nails and Fasteners	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.11	Wires or Rods	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.12	Packaging Film	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.13	Cords and Elastics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.14	Wheels, tires and axles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.15	Folding mechanisms and hinges	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.16	Holes, clearance and accessibility of mechanisms	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.17	Stability and over-load requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.18	Confined Spaces	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.19	Simulated protective devices	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.20	Projectile toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.21	Rattles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.22	Pacifiers	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.23	Squeeze Toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.24	Teethers and teething toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.25	Crib gyms, crib exercisers and similar toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.26	Toy chests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.27	Battery-Operated Toys				
4.27.1	Marking of Battery compartment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.27.2	Maximum DC potential	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.27.3	Unable to charge non-rechargeable batteries	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.27.4	Accessibility of batteries (under 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.27.5	Accessibility of batteries - small parts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4.27.6	Isolated circuits	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

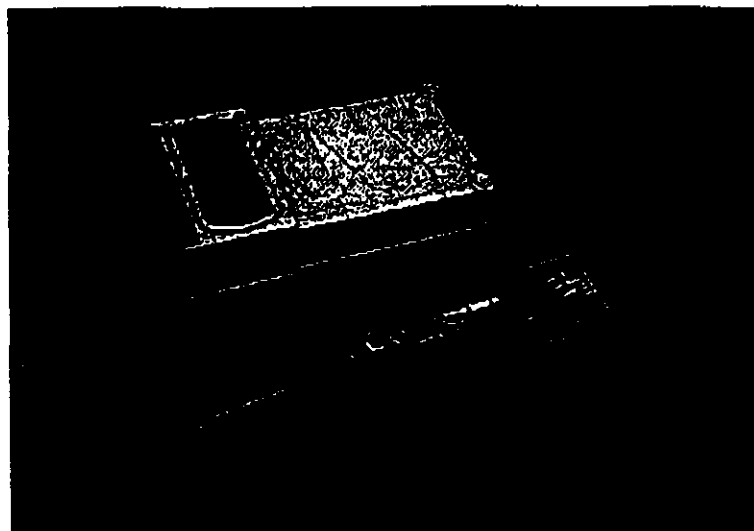
**April 12, 2002**  
**Report #: 20159**

P = Pass		F = Fail		N/A = Not Applicable		
Clause	Description	P	F	N/A		
4.27.7	Surface temperature of batteries (less than 71°C)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.27.8	No short circuits	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.27.9	No electrical contact (other than battery)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.27.10	Emitted gases	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.27.11	Instructions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
4.28	Flotation toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.29	Stroller/carriage toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.30	Stuffed/beanbag type toys	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.31	Art material	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.32	Toy guns	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.33	Balloons	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.34	Marbles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.35	Balls	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.36	Preschool Play Figures	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
4.37	Pom Poms	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
5.0	Labeling (as applicable)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6.0	Instructional literature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
7.0	Producers markings	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

**Conclusion:** When tested as specified, the submitted sample does comply with the *ASTM F963-96a* requirements for Mechanical Hazards.

**Intertek Testing Services**  
**Labtest**  
**Centuri Corporation**

**April 12, 2002**  
**Report #: 20159**



# Centuri Corporation

ESTES INDUSTRIES • COX

PO Box 227, 1295 H Street,  
Penrose, Co 81240 USA  
Phone: (719) 372-6565  
Telefax: (719) 372-3217

April 15, 2002

Via Facsimile and by Email

Phone: 301 504 0800  
Facsimile: 301 504 0127

Office of the Secretary  
US Consumer Product Safety Commission  
4330 East-West Hwy, Room 501  
Bethesda, MD 20207

## Proposed Exemption for Model Rocket Propellant Devices for Surface Vehicles HP 01-2 Supplemental Public Comment

Dear Madam/Sir:

On Friday, April 12, 2002, we submitted an independent Technical Report #20159 and video from Intertek Testing Services as a public comment in support of the Proposed Exemption for Model Rocket Propellant Devices for Surface Vehicles (Petition HP 01-2). This letter is supplemental to that comment.

As noted in the Summary of the Technical Report the Estes rocket cars comply with all applicable regulations and standards. And as can be determined from reading the Performance Review and watching the video, the rocket cars perform safely and as intended when used in accordance with the instructions and warnings. In addition, the video clearly demonstrates that the Blurzz rocket cars fail in a "safe" mode minimizing risk of injury. When run off the tether, the rocket cars did not become airborne and exhibited consistent behavior by flipping over and "skittering" about the ground for short distances. Even when ignited in a vertical position or run up a ramp the rocket cars either stopped short or returned to the ground within a very limited distance delivering such poor performance that user dissatisfaction is certain. Misuse or abuse is unlikely to continue when the performance is dissatisfying.

Please call Barry Tunick or me at 1.800.525.7563 should you have questions or require additional information.

Kind Regards,

*Mary Roberts*  
Mary Roberts, Manager  
Technical Services

Stevenson, Todd A.

*Handwritten:* model rocket comments 3

**From:** Mark B. Bundick [mbundick@earthlink.net]  
**Sent:** Sunday, April 14, 2002 9:21 PM  
**To:** cpssc-os@cpssc.gov  
**Cc:** nar-hq@nar.org; 76670.1775@compuserve.com; MCNABBS@TYSON.com; 103056.621@compuserve.com; 73121.75@compuserve.com; george@rachors.com; jpoole@cablespeed.com; 70760.2560@compuserve.com; kane@MIT.EDU; pmiller@wrangler.cisco.cc.tx.us  
**Subject:** Proposed exemption for model rocket propellant devices for surface vehicles

DATE: April 15, 2002

TO: Office of the Secretary  
Consumer Product Safety Commission  
Washington, DC 20207

Telephone: (301) 504-0800  
Email: cpssc-os@cpssc.gov

FROM: Mark B. Bundick  
President, National Association of Rocketry  
1311 Edgewood Drive  
Altoona, WI 54720

Telephone: (800) 262-4872  
Email: president@nar.org

RE: Proposed exemption for model rocket propellant devices for surface vehicles

Please find attached below comments submitted regarding the proposed exemption for model rocket propellant devices for surface vehicles on behalf of the National Association of Rocketry (NAR), a tax exempt, 501-3(c) educational organization for consumers of flyable sport rocket products. Five (5) copies of these comments will also be delivered via USPS to your offices.

The National Association of Rocketry appreciates this opportunity to provide public input into the proposed exemption. The NAR values its relationship with the National Fire Protection Association and the federal regulatory agencies in the promotion of consumer safety in the use of hobby rocket products.

Sincerely yours,  
Mark B. Bundick, President  
National Association of Rocketry  
1311 Edgewood Drive  
Altoona, WI 54720

Telephone: (800) 262-4872  
Email: president@nar.org

=====

PROPOSED EXEMPTION FOR  
MODEL ROCKET PROPELLANT DEVICES  
FOR SURFACE VEHICLES

Public Comment: National Association of Rocketry

Background Information



The National Association of Rocketry (NAR) is a 501-3(c) educational, service organization for consumers of flyable model rocket and high power rocket products. The organization has 5,000 members and 100 affiliated clubs. It sponsors competition events using flyable rocket products at the local, regional, and national levels. It has actively participated in international competition events hosted by the Federation Aeronautique Internationale (FAI; Paris).

Founded in 1957, the NAR has played a key role for almost 50 years in consumer safety issues regarding the use of flyable rocket products. The NAR maintains the "Model Rocket Safety Code" and "High Power Rocket Safety Code." A set of common sense rules, these codes are distributed to all consumers nationwide and provide guidance in the safe use of flyable rocket products.

Since 1957 hundreds of millions of flyable model rocket products have been used by consumers. Only one reported injury has occurred related to flyable model rocket products when the specifications of the safety code was being followed.

The NAR is A voting principle on the Committee on Pyrotechnics (National Fire Protection Association, NFPA) and chairs the Rocketry Task Force of this Committee. The Committee writes NFPA 1122 Code for Model Rockets, NFPA 1127 Code for High Power Rocket Rockets, and NFPA 1125 Code for the Manufacture of Model Rocket & High Power Rocket Motors.

The NAR tests all model rocket motors and many high power rocket motors prior to their sale to consumers. These tests are conducted in accordance to the motor certification requirements of NFPA 1125. NAR motor certification is a pre-requisite for the sale of model rocket and high power rocket motors in the majority of states (i.e., those states that follow the provisions of the NFPA codes).

The NAR has worked with the Consumer Product Safety Commission, Department of Transportation, Bureau of Alcohol, Tobacco, & Firearms, and the Federal Aviation Administration in the drafting and writing of federal regulations pertaining to the consumer use of flyable model rocket and high power rocket products. The NAR actively works with representatives from the CPSC and ATF as non-voting members of the NFPA Committee on Pyrotechnics.

As such, the National Association of Rocketry takes particular interest in the use of model rocket motors in surface vehicles and offers a comment for the consideration of the Consumer Product Safety Commission.

#### Comments

1. The NAR concurs that the use of D-powered model rocket motors in rocket cars should be prohibited until the issues discovered in the CPSC tests are fully addressed. It is not a surprise to the NAR that the D-powered surface vehicles when un-tethered became airborne projectiles. The failure mode of the A-powered cars is also not unexpected as there is a power difference of a factor 8 between the A and D model rocket motors.

The use of the D-powered products restricted to individuals 18 years of age or older is a prudent approach. The NAR has worked with rocket-powered cars in the past with motors in the F and G class. These products were never used by children, and were only used by adults.

The NAR concurs with the findings of the CPSC and recommends that the exemption on rocket-powered cars be restricted to only A class or smaller motors, at this time. This would exclude B, C, and D class motors.

2. The NAR offers the following wording change to the proposed exemption:  
(14) Model rocket propellant devices (model rocket motors) designed to propel lightweight surface vehicles such as model rocket rocket-powered cars...

The term "model rocket" has been used for 50 years to denote flyable

products, and is defined within the NFPA codes assuming that the products will be flown and not used in a manner counter to the specifications of the "Model Rocket Safety Code."

The NAR respectfully requests the CPSC not to refer to surface vehicles as "model rocket cars" but instead as "rocket-powered cars" to avoid confusion among consumers and public safety officials utilizing the NFPA codes in their jurisdictions.

3. The NAR is concerned about surface vehicles that might be designed to use more than one motor. Increasing the number of motors in these vehicles increases the number of failure modes.

The NAR offers the following wording change to the proposed exemption:

(C) Are designed so that they cannot accept propellant devices measuring larger than 0.5" (13 mm) in diameter and 1.75" (44 mm) in length;

(D) Are designed so that they cannot accept more than one propellant device;

[Re-label the old (D), (E), and (F) to (E), (F), and (G).]